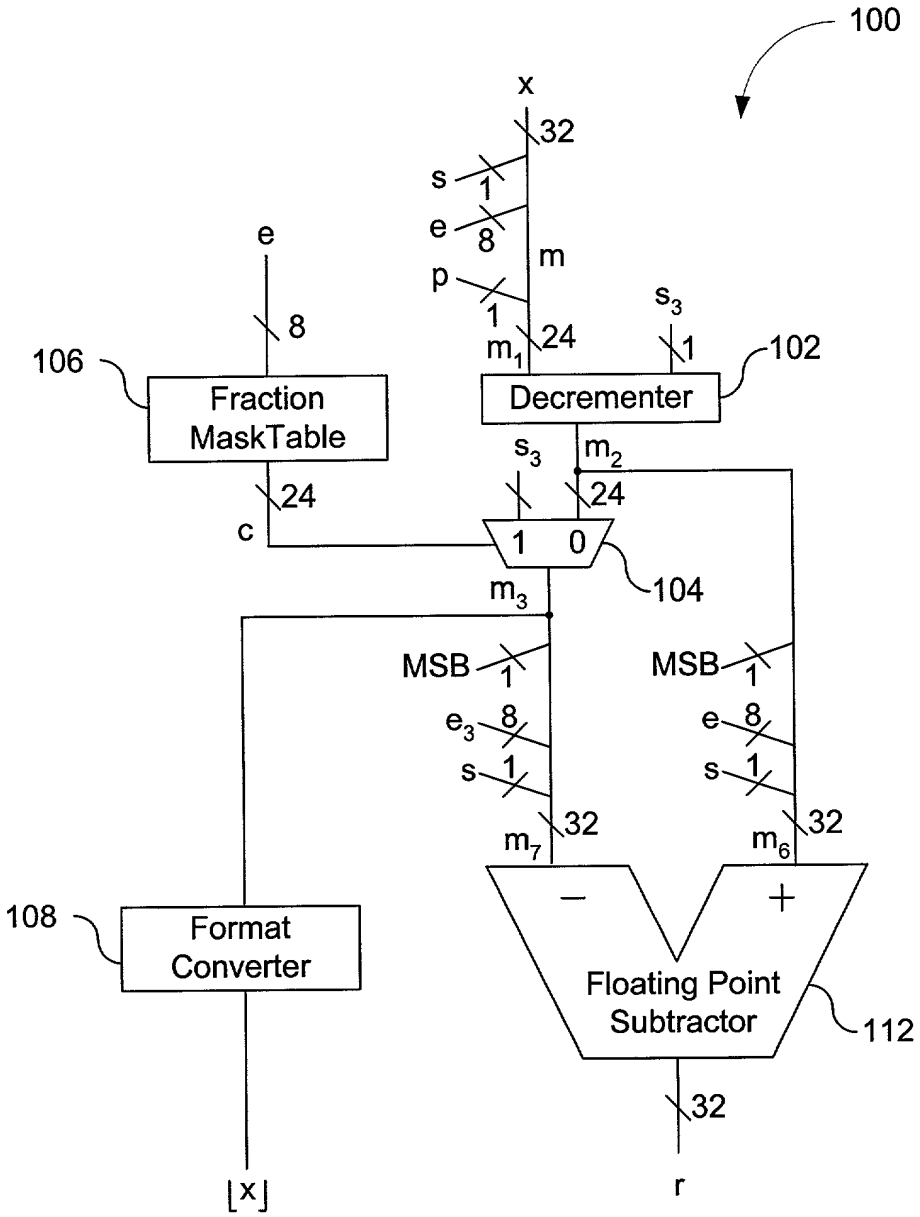
100
x
32
s
1
e
8
m
p
1
m1
24
s3
1
102
Decrementer
106
Fraction
MaskTable
e
8
24
c
s3
m2
24
1 0
104
m3
MSB
1
e3
8
s
1
m7
32
MSB
1
e
8
s
1
m6
32
108
Format
Converter
Floating Point
Subtractor
112
32
[x]
r

FIG. 1

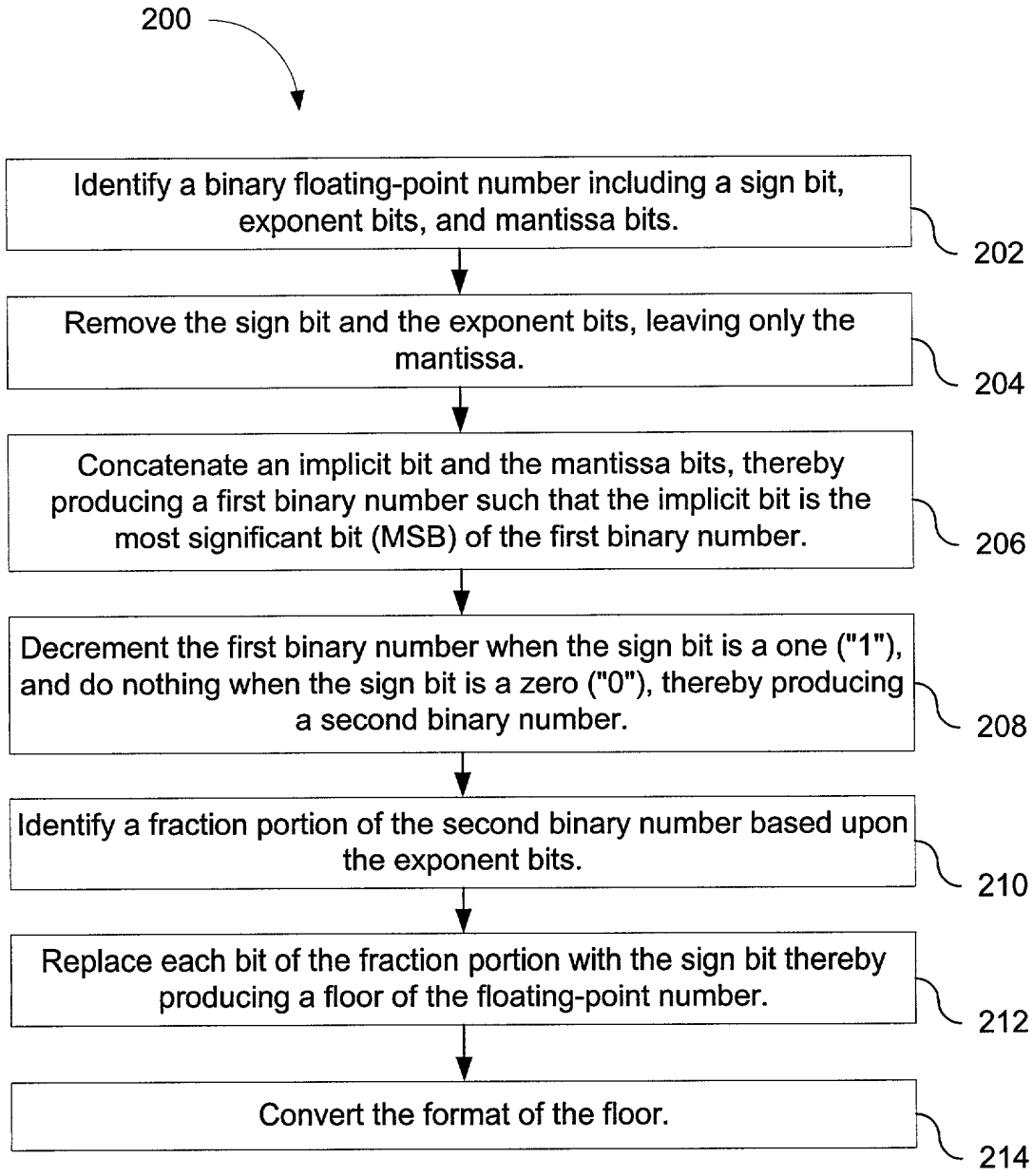
200
Identify a binary floating-point number including a sign bit, exponent bits, and mantissa bits.
202
Remove the sign bit and the exponent bits, leaving only the mantissa.
204
Concatenate an implicit bit and the mantissa bits, thereby producing a first binary number such that the implicit bit is the most significant bit (MSB) of the first binary number.
206
Decrement the first binary number when the sign bit is a one ("1"), and do nothing when the sign bit is a zero ("0"), thereby producing a second binary number.
208
Identify a fraction portion of the second binary number based upon the exponent bits.
210
Replace each bit of the fraction portion with the sign bit thereby producing a floor of the floating-point number.
212
Convert the format of the floor.
214

FIG. 2

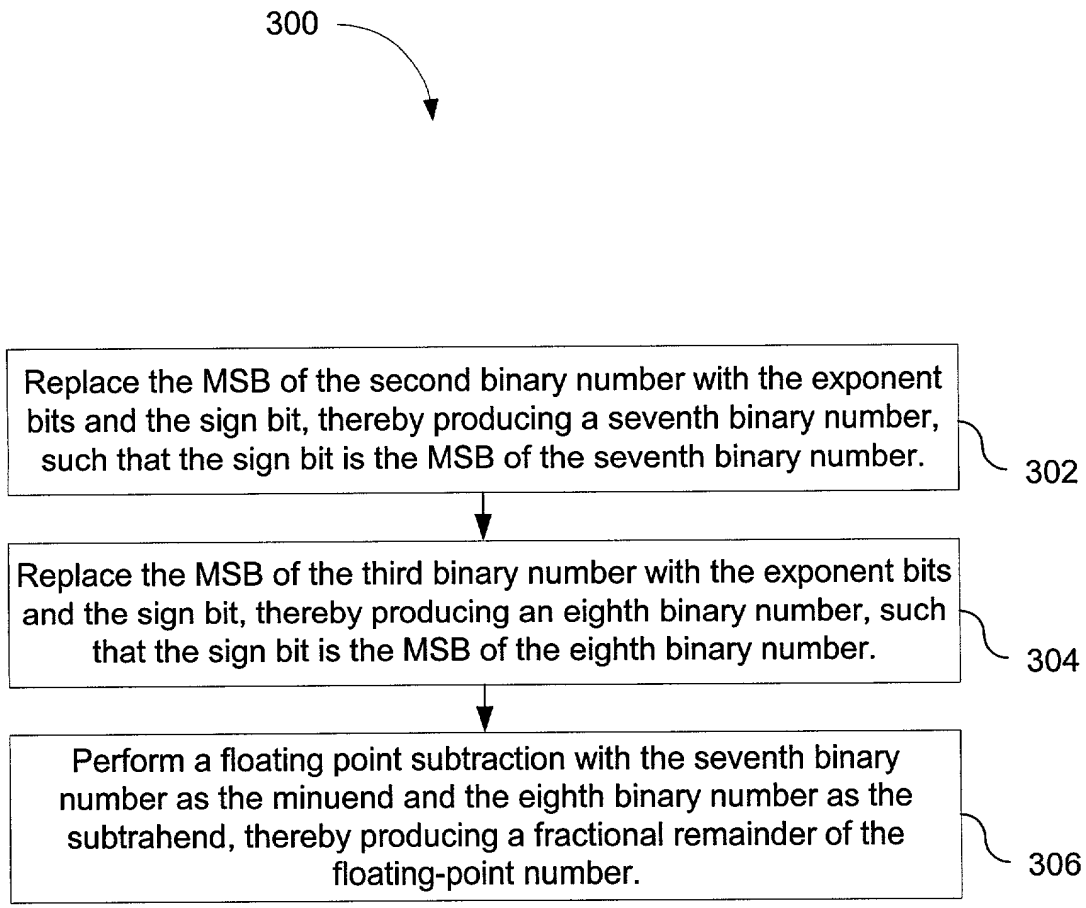
300
Replace the MSB of the second binary number with the exponent bits and the sign bit, thereby producing a seventh binary number, such that the sign bit is the MSB of the seventh binary number.
302
Replace the MSB of the third binary number with the exponent bits and the sign bit, thereby producing an eighth binary number, such that the sign bit is the MSB of the eighth binary number.
304
Perform a floating point subtraction with the seventh binary number as the minuend and the eighth binary number as the subtrahend, thereby producing a fractional remainder of the floating-point number.
306

FIG. 3

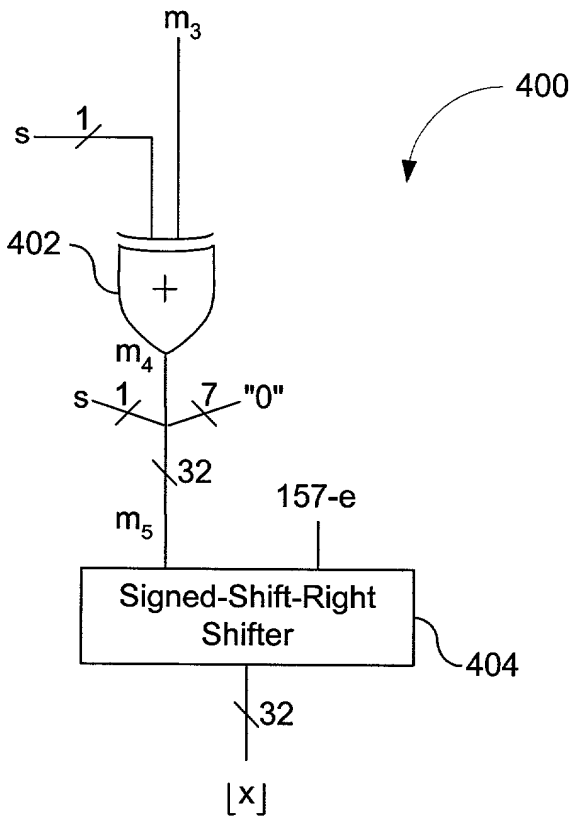
m3
400
s
1
402
+
m4
s
1
7
"0"
32
157-e
m5
Signed-Shift-Right
Shifter
404
32
⌊x⌋

FIG. 4

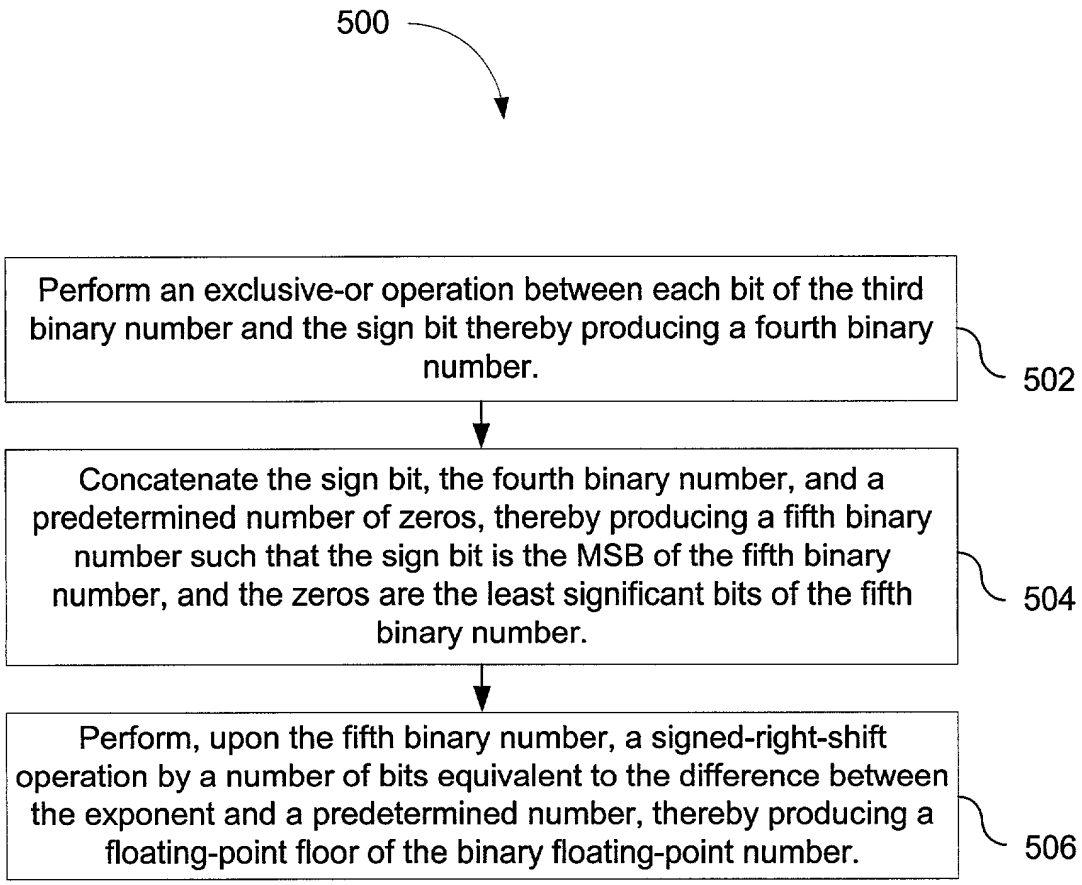
500
Perform an exclusive-or operation between each bit of the third binary number and the sign bit thereby producing a fourth binary number.
502
Concatenate the sign bit, the fourth binary number, and a predetermined number of zeros, thereby producing a fifth binary number such that the sign bit is the MSB of the fifth binary number, and the zeros are the least significant bits of the fifth binary number.
504
Perform, upon the fifth binary number, a signed-right-shift operation by a number of bits equivalent to the difference between the exponent and a predetermined number, thereby producing a floating-point floor of the binary floating-point number.
506

FIG. 5

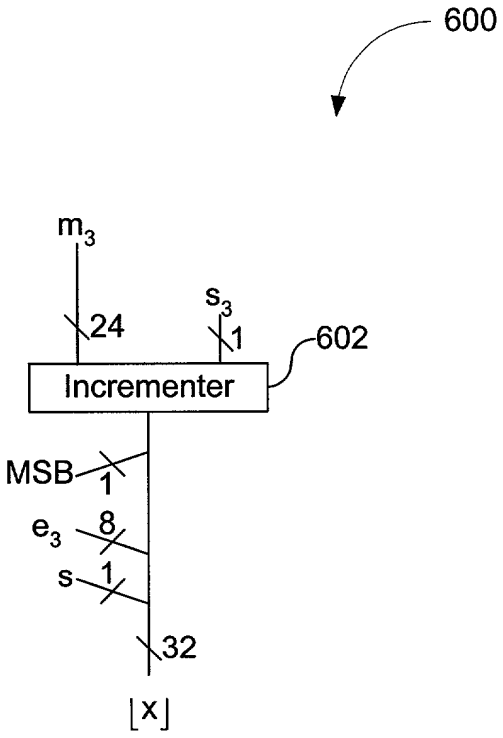

FIG. 6

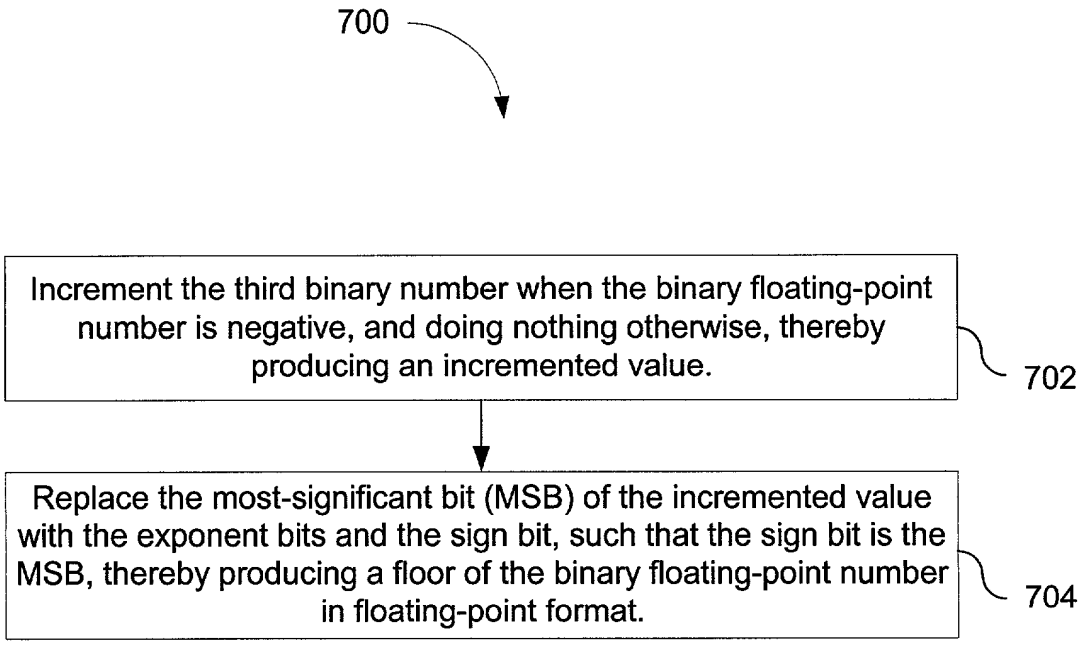
700
Increment the third binary number when the binary floating-point number is negative, and doing nothing otherwise, thereby producing an incremented value.
702
Replace the most-significant bit (MSB) of the incremented value with the exponent bits and the sign bit, such that the sign bit is the MSB, thereby producing a floor of the binary floating-point number in floating-point format.
704

FIG. 7